**Improving Outcomes and Care Experience among Dual Eligible Members: The Role of Health System Factors**

Banerjee, Somalee MD, MPH, Catherine Lee, PhD, Richard Grant, MD, MPH, Julie Schmittdiel, PhD, Lin Ma, MS, Alyce S. Adams, PhD

|  |  |
| --- | --- |
| Challenge | **The complex health and social needs of dual eligible members (e.g. Medi-cal and Medicare) puts them at higher risk for persistently high health care costs, but little is known about healthcare outcomes and modifiable drivers of these costs.** KPNC is developing innovative interventions. The proposed study will be among the first to identify health system factors associated with care processes and outcomes among dual eligibles in a capitated health care system overall and across coverage subtypes. |
| Existing Evidence |  At KPNC, dual eligibles represent only 4% of all newly enrolled Medicaid members, but account for more than 10% of high cost members. 1 Fragmentation of health care services may impede care optimization; integrated care may improve value,2 but results from various managed care plans are mixed, with likely variability of populations and interventions.3,4,5-11 Little evidence exists about health system level interventions might reduce low value, expensive utilization and improve care among dual eligibles.9,10  |
| Target Population | KPNC members who became newly dually eligible between 2016 and 2019, stratified by dual enrollment status: Special Needs Population (SNP) + Medicaid Managed Care (MCMC), SNP only, Medicare + MCMC, and Medicare Only (Figure 1). |
| Intervention or Exposure | Key exposures: dual enrollment status and health system level factors for utilization from prior research studies. Primary outcome: readmission or admission to the hospital or emergency department (ED) for an ambulatory sensitive condition during the year following dual eligibility. Methods: microsimulation to evaluate changing modifiable factors and Cox PH models (i.e., dual enrollment status, engagement in kp.org) on risk of the primary outcome.  |
| **Outcomes/Key Findings** | **Facilities varied in outcomes; the lowest region (Sacramento) had 30% lower risk of potentially avoidable ED and hospital use than the highest region (Redwood City). Models suggest enrolling dual eligible currently in Medicare Only or D-SNP Only into D-SNP plus Medicaid Managed care may markedly reduce risk (Figure 2).**There are significant differences in the baseline health, demographics and healthcare utilization between the dual eligible subgroups. [Table 1] :Factors associated with ***lower*** risk (see also Table 2)-older age (>50 years); enrollment in both D-SNP and Medicaid or in Medicare alone (versus D-SNP only); Asian race; discordant patient/provider language. Factors associated with ***higher*** risk -not using the patient portal [HR: 1.34; 95% Confidence Interval:(1.2, 1.5)]; multi-morbidity;living in a lower socioeconomic status neighborhood  |
| **Resulting Action/Change** | **Work with the SNP group in the TPMG consulting group and the regional hospital resource management group to interpret findings and to identify potential avenues for intervention.** |
| Additional Recommendations | Assessing reasons for variation in dual enrollment in D-SNP plus MCMC may be informative; evaluation of TPMG leadership awareness of findings and any recommendations for further study that would inform operations. |
| Implementation Tools  | We will explore whether the simulation tool created as part of this project might be useful to TPMG in identifying potential intervention components. |
| Implementation Measurement | NA  |
| Reference | Figure 1. Cohort building algorithm for the studyFigure 2. Microsimulation: Effect of switching coverage status for dual eligible on time to avoidable hospitalizations and ED visitsTable 1. Patient characteristics of the dual eligible population studied

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Independent factor** | **Level** | **All (N=36,961)\* n(%)** | **D-SNP Only (N=13,941)\* n(%)** | **D-SNP+MCMC (N=2,011)\* n(%)** | **KPSA Only (N=11,916)\* n(%)** | **KPSA+MCMC /MCMC Only (N=9,093)\* n(%)** | **P Value** |
| Patient Age on the Index Date | Mean (SD) | 64.69 (13.61) | 64.46 (13.65) | 61.09 (12.86) | 69.32 (13.47) | 59.78 (11.73) | <0.0001\* |
| Sex |  |  |  |  |  |  | <0.0001\* |
|  | FEMALE | 21852 (59.12) | 8166 (58.58) | 1147 (57.04) | 7349 (61.67) | 5190 (57.08) |  |
|  | MALE | 15107 (40.88) | 5774 (41.42) | 864 (42.96) | 4567 (38.33) | 3902 (42.92) |  |
| Race/Ethnicity |  |  |  |  |  |  | <0.0001\* |
|  | 1.White | 13821 (37.39) | 4396 (31.53) | 886 (44.06) | 5023 (42.15) | 3516 (38.67) |  |
|  | 2.Asian | 8167 (22.10) | 3403 (24.41) | 488 (24.27) | 2238 (18.78) | 2038 (22.41) |  |
|  | 3.Black | 4980 (13.47) | 2054 (14.73) | 214 (10.64) | 1495 (12.55) | 1217 (13.38) |  |
|  | 4.Hispanic | 7849 (21.24) | 3144 (22.55) | 330 (16.41) | 2531 (21.24) | 1844 (20.28) |  |
|  | 5.Other | 639 (1.73) | 253 (1.81) | 33 (1.64) | 177 (1.49) | 176 (1.94) |  |
|  | 6.Unknown | 1505 (4.07) | 691 (4.96) | 60 (2.98) | 452 (3.79) | 302 (3.32) |  |
| Standardized Neighborhood Deprivation Index Score | Mean (SD) | 0.24 (0.98) | 0.39 (1.03) | 0.15 (0.88) | 0.15 (0.95) | 0.16 (0.94) | <0.0001\* |
|  |  |  |  |  |  |  |  |
| Standardized Neighborhood Deprivation Index (quartiles) | Q1 | 4912 (13.29) | 1450 (10.40) | 287 (14.27) | 1814 (15.22) | 1361 (14.97) | <0.0001\* |
|  | Q2 | 9490 (25.68) | 3196 (22.93) | 525 (26.11) | 3333 (27.97) | 2436 (26.79) |  |
|  | Q3 | 9964 (26.96) | 3633 (26.06) | 605 (30.08) | 3184 (26.72) | 2542 (27.96) |  |
|  | Q4 | 11843 (32.04) | 5160 (37.01) | 589 (29.29) | 3377 (28.34) | 2717 (29.88) |  |
|  | Unknown | 752 (2.03) | 502 (3.60) | 5 (0.25) | 208 (1.75) | 37 (0.41) |  |
|  |  |  |  |  |  |  |  |
| Most Recent BMI Prior to the Index  | 1.Under/Normal | 7327 (19.82) | 1723 (12.36) | 534 (26.55) | 3022 (25.36) | 2048 (22.52) | <0.0001\* |
|  | 2.Overweight | 7324 (19.82) | 1693 (12.14) | 525 (26.11) | 2675 (22.45) | 2431 (26.73) |  |
|  | 3.Obese | 8785 (23.77) | 2047 (14.68) | 727 (36.15) | 2699 (22.65) | 3312 (36.42) |  |
|  | 4.Unknown | 13525 (36.59) | 8478 (60.81) | 225 (11.19) | 3520 (29.54) | 1302 (14.32) |  |
|  |  |  |  |  |  |  |  |
| Baseline Smoking Status | 1.None | 12945 (35.02) | 2957 (21.21) | 839 (41.72) | 4702 (39.46) | 4447 (48.91) | <0.0001\* |
|  | 2.Former | 6829 (18.48) | 1363 (9.78) | 459 (22.82) | 2675 (22.45) | 2332 (25.65) |  |
|  | 3.Current | 2349 (6.36) | 669 (4.80) | 180 (8.95) | 711 (5.97) | 789 (8.68) |  |
|  | 4.Unknown | 14838 (40.15) | 8952 (64.21) | 533 (26.50) | 3828 (32.12) | 1525 (16.77) |  |
|  |  |  |  |  |  |  |  |
| Alcohol Consumption | No | 13112 (35.48) | 2635 (18.90) | 874 (43.46) | 5012 (42.06) | 4591 (50.49) | <0.0001\* |
|  | Yes | 5066 (13.71) | 941 (6.75) | 358 (17.80) | 1776 (14.90) | 1991 (21.90) |  |
|  | Not applicable/Unknown | 18783 (50.82) | 10365 (74.35) | 779 (38.74) | 5128 (43.03) | 2511 (27.61) |  |
| Doing any Exercise |  |  |  |  |  |  | <0.0001\* |
|  | No | 11984 (32.42) | 2632 (18.88) | 818 (40.68) | 4756 (39.91) | 3778 (41.55) |  |
|  | Yes | 10451 (28.28) | 2350 (16.86) | 972 (48.33) | 3246 (27.24) | 3883 (42.70) |  |
|  | Not applicable/Unknown | 14526 (39.30) | 8959 (64.26) | 221 (10.99) | 3914 (32.85) | 1432 (15.75) |  |
|  |  |  |  |  |  |  |  |
| 150 Minutes MVPA/Week | No | 17070 (46.18) | 3731 (26.76) | 1284 (63.85) | 6390 (53.63) | 5665 (62.30) | <0.0001\* |
|  | Yes | 5290 (14.31) | 1232 (8.84) | 500 (24.86) | 1590 (13.34) | 1968 (21.64) |  |
|  | Not applicable/Unknown | 14601 (39.50) | 8978 (64.40) | 227 (11.29) | 3936 (33.03) | 1460 (16.06) |  |
| Elixhauser Comorbidity Index | Mean (SD) | 4.94 (3.78) | 4.68 (3.60) | 4.68 (3.53) | 5.56 (4.02) | 4.57 (3.70) | <0.0001\* |
|  |  |  |  |  |  |  |  |
| Patient/provider race concordance | No | 19107 (51.70) | 6442 (46.21) | 1044 (51.91) | 6580 (55.22) | 5041 (55.44) | <0.0001\* |
|  | Yes | 13717 (37.11) | 5115 (36.69) | 867 (43.11) | 4151 (34.84) | 3584 (39.41) |  |
|  | Not applicable/Unknown | 4137 (11.19) | 2384 (17.10) | 100 (4.97) | 1185 (9.94) | 468 (5.15) |  |
|  |  |  |  |  |  |  |  |
| Patient-Physician Language Concordance | No | 5605 (15.16) | 2726 (19.55) | 247 (12.28) | 1339 (11.24) | 1293 (14.22) | <0.0001\* |
|  | Yes | 31215 (84.45) | 11151 (79.99) | 1761 (87.57) | 10518 (88.27) | 7785 (85.62) |  |
|  | Not applicable/Unknown | 141 (0.38) | 64 (0.46) | 3 (0.15) | 59 (0.50) | 15 (0.16) |  |
|  |  |  |  |  |  |  |  |
| Kp.org Registration | No | 16320 (44.15) | 9005 (64.59) | 450 (22.38) | 4667 (39.17) | 2198 (24.17) | <0.0001\* |
|  | Yes | 20641 (55.85) | 4936 (35.41) | 1561 (77.62) | 7249 (60.83) | 6895 (75.83) |  |
|  |  |  |  |  |  |  |  |
| Kp.org Use at Baseline | No | 21928 (59.33) | 10902 (78.20) | 684 (34.01) | 6710 (56.31) | 3632 (39.94) | <0.0001\* |
|  | Yes | 15033 (40.67) | 3039 (21.80) | 1327 (65.99) | 5206 (43.69) | 5461 (60.06) |  |
| # of Outpatient Visits Within 24 Months Before Index Date | Mean (SD) | 10.76 (18.14) | 8.14 (14.91) | 12.11 (18.96) | 10.23 (17.16) | 12.79 (20.55) | <0.0001\* |
| # of ED Visits Within 24 Months Before Index Date | Mean (SD) | 2.45 (2.73) | 2.27 (2.58) | 2.08 (1.90) | 2.63 (2.83) | 2.45 (2.86) | <0.0001\* |
| # of Inpatient Visits Within 24 Months Before Index Date | Mean (SD) | 1.74 (1.35) | 1.57 (1.18) | 1.62 (1.11) | 1.81 (1.35) | 1.75 (1.47) | 0.0002 |
| cms\_risk\_ | Mean (SD) | 1.27 (1.05) | 1.13 (0.90) | 1.12 (0.64) | 1.46 (1.22) | 1.38 (1.08) | <0.0001\* |
| Proximity to Primary KP Facility | Mean (SD) | 8.43 (53.18) | 8.52 (56.24) | 5.29 (6.20) | 9.30 (57.86) | 7.89 (47.68) | 0.0117 |

Table 2. Results of Cox Proportional Hazards Models Estimating Time to Avoidable Hospitalizatio or ED Use During the 1st 12 Months Follow Dual Eligibility

|  |  |  |  |
| --- | --- | --- | --- |
| **Covariates** |  | **Hazard Ratio (Adjusted)** | **95% Confidence Interval** |
| Facility (ref=Central Valley) |  |  |  |
|   | Diablo | 0.87 | (0.7,1.08) |
|   | East Bay | 0.81 | (0.66,0.98) |
|   | Fresno | 0.78 | (0.62,0.97) |
|   | Greater San Francisco | 0.74 | (0.58,0.95) |
|   | Greater Southern Alameda | 0.75 | (0.6,0.93) |
|   | Marin / Sonoma | 0.87 | (0.68,1.11) |
|   | Napa / Solano | 0.83 | (0.66,1.05) |
|   | Redwood City | 1 | (0.58,1.73) |
|   | Roseville | 0.71 | (0.57,0.88) |
|   | Sacramento | 0.69 | (0.57,0.85) |
|   | San Jose | 0.8 | (0.58,1.11) |
|   | Santa Clara | 0.75 | (0.55,1.02) |
|   | South Sacramento | 0.74 | (0.6,0.9) |
| Age (ref=<50) | Age:(50,65] | 0.69 | (0.6,0.8) |
|   | Age:(65,80] | 0.58 | (0.5,0.68) |
|   | Age:(80,106] | 0.7 | (0.58,0.84) |
| Dual Subtype (ref=D-SNP Only) | Dual:D-SNP+MCMC | 0.76 | (0.6,0.96) |
|   | Dual:KPSA Only | 0.82 | (0.73,0.93) |
|   | Dual:KPSA+MCMC/MCMC Only | 0.91 | (0.79,1.06) |
| Race (ref=white) | Race:Asian | 0.73 | (0.61,0.87) |
|   | Race:Black | 1.05 | (0.91,1.2) |
|   | Race:Latino | 0.96 | (0.84,1.1) |
|   | Race:Missing | 1.08 | (0.73,1.61) |
|   | Race:Other/Mixed | 1.04 | (0.75,1.43) |
| Elixhauser Comorbidity Score (ref=Quartile 1: lowest comorbidity) | Elix:Q2:3-4 | 3.48 | (2.73,4.45) |
|   | Elix:Q3:5-7 | 7.78 | (6.06,9.99) |
|   | Elix:Q4:7-23 | 19.92 | (15.82,25.07) |
|   | Elix:Miss | 0 | (0,Inf) |
| Neighborhood Deprivation Index (ref=Quartile 1: highest SES) | NDI:Q2 | 1.28 | (1.05,1.57) |
|   | NDI:Q3 | 1.41 | (1.16,1.72) |
|   | NDI:Q4 | 1.53 | (1.26,1.86) |
|   | NDI:Miss | 1.43 | (1.01,2.03) |
| KP.org Use (rer=yes) | Kp\_org:No | 1.34 | (1.2,1.5) |
| Race concordance between patient and physician (ref=yes) | Race concord:No | 1.07 | (0.95,1.21) |
|   | Race concord: Missing | 0.96 | (0.78,1.19) |
| Language concordance between patient and physician (ref=yes) | Lang concord:No | 0.81 | (0.68,0.96) |
|   | Lang concord: Missing | 2.85 | (0.71,11.49) |

**References:**1. MedPAC. A Data Book: Health Care spending and the Medicare Program. Chapter 4. Dual Eligible Beneficiaries. <http://www.medpac.gov/docs/default-source/data-book/jun18_databookentirereport_sec.pdf?sfvrsn=0>. 2018.
2. Ferris R, Blaum C, Kiwak E, et al. Perspectives of Patients, Clinicians, and Health System Leaders on Changes Needed to Improve the Health Care and Outcomes of Older Adults With Multiple Chronic Conditions. *J Aging Health*. 2018;30(5):778-799.
3. [Jung HY](https://www.ncbi.nlm.nih.gov/pubmed/?term=Jung%20HY%5BAuthor%5D&cauthor=true&cauthor_uid=26633095), [Trivedi AN](https://www.ncbi.nlm.nih.gov/pubmed/?term=Trivedi%20AN%5BAuthor%5D&cauthor=true&cauthor_uid=26633095), [Grabowski DC](https://www.ncbi.nlm.nih.gov/pubmed/?term=Grabowski%20DC%5BAuthor%5D&cauthor=true&cauthor_uid=26633095), [Mor V](https://www.ncbi.nlm.nih.gov/pubmed/?term=Mor%20V%5BAuthor%5D&cauthor=true&cauthor_uid=26633095). Integrated Medicare and Medicaid managed care and rehospitalization of dual eligibles. [Am J Manag Care.](https://www.ncbi.nlm.nih.gov/pubmed/26633095) 2015 Oct;21(10):711-7.
4. Bennett KJ, Probst JC. Thirty-Day Readmission Rates Among Dual-Eligible Beneficiaries. *J Rural Health*. 2016;32(2):188-195.
5. Block J. Dual-eligible dilemma. States test managed care, but critics question if approach is cost-effective. *Mod Healthc*. 2013;43(16):14.
6. Grabowski DC, Joyce NR, McGuire TG, Frank RG. Passive Enrollment Of Dual-Eligible Beneficiaries Into Medicare And Medicaid Managed Care Has Not Met Expectations. *Health Aff* . 2017;36(5):846-854.
7. Libersky J, Hedley Dodd A, Verghese S. National and state trends in enrollment and spending for dual eligibles under age 65 in Medicaid managed care. *Disabil Health J*. 2013;6(2):87-94.
8. Zhang Y, Diana ML. Effects of Early Dual-Eligible Special Needs Plans on Health Expenditure. *Health Serv Res*. October 2017. doi:10.1111/1475-6773.12778
9. Eggbeer B, Bowers K, Morris D. Dual-eligible reform: a step toward population health management. *Healthc Financ Manage*. 2013;67(4):90-94, 96.
10. Gold MR, Jacobson GA, Garfield RL. There is little experience and limited data to support policy making on integrated care for dual eligibles. *Health Aff* . 2012;31(6):1176-1185.
11. Graham CL, Liu P-J, Hollister BA, Kaye HS, Harrington C. Beneficiaries Respond To California’s Program To Integrate Medicare, Medicaid, And Long-Term Services. *Health Aff*. 2018;37(9):1432-1441.
12. MedPAC. The June 2018 Report to Congress: Medicare and the Health Care Delivery System. Chapter 9. Managed
 |

Author 1, degree, Author 2, degree, …

|  |  |
| --- | --- |
| Challenge | **BOLD text**  |
| Existing Evidence | Normal text  |
| Target Population | Normal text |
| Intervention or Exposure | Normal text  |
| **Outcomes/Key Findings** | **BOLD summary sentence.** Normal text supporting sentence(s), as needed.  |
| **Resulting Action/Change** | **BOLD text** |
| Additional Recommendations | Normal text |
| Implementation Tools  | Normal text |
| Implementation Measurement | Normal text |
| Reference | Figure, table, graphical abstractdoi:  |
| In carrying out this project, what problems or barriers did you encounter? (50 words or less) |  |
| In your experience with this project, what was the most positive or constructive aspect? (50 words or less) |  |
| Dissemination -- did your project lead to a presentation, report or publication?  | [ ]  No, please describe barriers, if any.[ ]  Yes, please list. |
| Did you or others learn something else from your project?  | [ ]  Formed a new relationship [ ]  Learned that the right data aren’t currently available [ ]  Identified unanticipated barriers to improving clinical practice [ ]  Other learnings |